Campbell 2006.
(1-16).

17

USEFUL DATA

ON THE

RISE OF THE NILE

WITH

TABLES OF LOWEST & HIGHEST
WATER LEVEL AT PLACES
ON THE DAMIETTA & ROSETTA BRANCHES

AND

TABLE OF LOWEST & HIGHEST
WATER LEVEL AT THE RODAH NILOMETER

During

58 YEARS

BY

J. L. MANOUG, E. C. P.

CIVIL ENGINEER,

Chief of the Central Office of the Permanent Way
Department of Egyptian Railways.

ALEXANDRIA. — PRINTING-OFFICE V. PENASSON

1882

A New Planet.

M. Trouvelot, the French observer of the late eclipse of the sun, has consulted with Professor Swift, of the Warner Observatory, regarding the identity of the strange red star which M. Trouvelot and his assistant saw three degrees to the north-west of the sun. The result is the establishment, with approximate certainty, of the existence of the hitherto suppositious intra-mercurial planet.

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USEFUL DATA ON THE RISE OF THE NILE

The desordered state of the country this year, has not allowed to get any news of the rise of the Nile;—Data of the avertage rise and fall of 8 years (from 1870 to 1878) will be therefore welcomed by those who watch with interest the fluctuations of the Nile.

The Nile does not begin to rise at a fixed date; the commencement of the increase varies from the 5th to the 30 June, and has taken place still later, we believe this year; but the 15th of June may be taken as the average date at which it occurs.

The rise continues till a date varying from the 11th October to the 18th November after which the Nile level goes on decreasing till the follewing rise.

The rise of the Nile is usually made known by daily bills issued and published in the papers, but the issue of the bills is stopped as soon as the period of decrease is decidedly reached.

We can therefore give an average of the rates of increase of the Nile, but we are unable to do the same for the decrease.

It rarely occurs that the flood diminishes of the same quantity it has increased; but we shall consider the fall equal to the rise in order to give an approximation of the rates of decrease.

Increase

PERIOD	RATE or ratio to the total rise
From the 10th to 30th June .	0,088
In July.	0,383
In August	0,393
In September	0,136
	1,000

Decrease

PERIOD	RATE or ratio of decrease to the total rise
In October.	0,146
In November.	0,300
In December.	0,150
In January.	0,105
In February	0,078
In March.	0,082
In April	0,069
In May.	0,044
From the 1st to 9th of June .	0,026
	1,000

When the total rise of the flood is known, the fluctuations of water level in the Nile may then be obtained by multiphying the rates in the preceding tables by the total rise.

The following table will be found serviceable in the present circumstances ; it gives for every day of a bissextile year the average of the altitudes of the Nile level at the Rodah Nilomèter (Cairo), above the average level of the Mediterranean, the figures being the average of eight years, from the 9th September 1870 to the 9th September 1878. In the last column opposite to each figure is given the corresponding height in Peeks and kirats of which we shall hereafter give the value.

Average altitude of the Nile.

JUNE	BACHANS	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	26	12,423	7— 8
2	27	12,413	7— 7
3	28	12,406	7— 7
1	29	12,419	7— 8
5	30	12,498	7—11
6	1st BAOUNA	12,390	7— 7
7	2	12,391	7— 7
8	3	12,390	7— 7
9	4	12,249	7— 0
10	5	12,384	7— 6
11	6	12,398	7— 7
11	7	12,416	7— 7
13	8	12,418	7— 8
14	9	12,427	7— 8
15	10	12,438	7— 9
16	11	12,467	7— 9
17	12	12,485	7—10
18	13	12.507	7—11
19	14	12,526	7—12
20	15	12,540	7—13
21	16	12,538	7—13
22	17	12.621	7—15
23	18	12,624	7—15
24	19	12,698	7—20
25	20	12,756	7—23
26	21	12,786	8—00
27	22	12,836	8—02
28	23	12,871	8—04
29	24	12,803	8—00
30	25	12,908	8—05

JULY	BAOUNA	Altitudes above the Mediterranean	Height in Peeks and Kirats
		Metres	Peeks Kirats
1	26	13,002	8—10
2	27	13,044	8—11
3	28	13,099	8—13
4	29	13,144	8—15
5	30	13,175	8—17
6	1st ABEEB	13,229	8—20
7	2	13,272	8—21
8	3	13,311	9—00
9	4	13,338	9—00
10	5	13,360	9—01
11	6	13,403	9—03
12	7	13,464	9—06
13	8	13,469	9—06
14	9	13,494	9—08
15	10	13,595	9—09
16	11	13,629	9—14
17	12	13,748	9—19
18	13	13,823	9—22
19	14	13,904	10—01
20	15	13,986	10—05
21	16	14,079	10—09
22	17	14,209	10—15
23	18	14,369	10—22
24	19	14,512	11—05
25	20	14,677	11—11
26	21	14,849	11—20
27	22	15,035	12—04
28	23	15,220	12—12
29	24	15,397	12—20
30	25	15,563	13—03
31	26	15,774	13—12

AUGUST	ABEEB	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	27	15,981	13—21
2	28	16,184	14—07
3	29	16,401	14—16
4	30	16,600	15—01
5	1st MISRA	16,831	15—11
6	2	16,988	15—19
7	3	17,144	16—03
8	4	17,297	16—17
9	5	17,379	17—00
10	6	17,497	17—10
11	7	17,647	18—00
12	8	17,839	18—17
13	9	18,034	19—11
14	10	18,320	20—11
15	11	18,274	20—07
16	12	18,269	20—06
17	13	18,426	20—21
18	14	18,463	21—00
19	15	18,552	21—08
20	16	18,550	21—08
21	17	18,567	21—09
22	18	18,623	21—14
23	19	18,666	21—18
24	20	18,690	21—20
25	21	18,703	21—21
26	22	18,700	21—21
27	23	18,700	21—21
28	24	18,707	21—21
29	25	18,709	21—22
30	26	18,724	21—23
31	27	18,723	21—23

SEPTEMber	MISRA	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peek Kirat
1	28	18,723	21—23
2	29	18,750	22—01
3	30	18,776	22—02
4	Épagomenes 1	18,808	22—03
5	2	18,830	22—04
6	3	18,849	22—05
7	4	18,885	22—07
8	5	18,925	22—09
9	6	18,283	20—08
10	1st TOUT	19,277	23—00
11	2	19,296	23—01
12	3	19,299	23—01
13	4	19,348	23—03
14	5	19,372	23—04
15	6	19,416	23—04
16	7	19,457	23—08
17	8	19,496	23—10
18	9	19,533	23—12
19	10	19,585	23—13
20	11	19,612	23—15
21	12	19,640	23—16
22	13	19,660	23—17
23	14	19,682	23—18
24	15	19,694	23—19
25	16	19,704	23—19
26	17	19,712	23—20
27	18	19,722	23—20
28	19	19,729	23—20
29	20	19,730	23—20
30	21	19,734	23—20

OCTOBER	TOUT	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	22	19,729	23—20
2	23	19,722	23—20
3	24	19,722	23—20
4	25	19,719	23—20
5	26	19,704	23—19
6	27	19,670	23—18
7	28	19,637	23—16
8	29	19,620	23—19
9	30	19,595	23—14
10	1st BABEH	19,577	23—13
11	2	19,607	23—15
12	3	19,596	23—14
13	4	19,570	23—13
14	5	19,550	23—12
15	6	19,526	23—11
16	7	19,631	23—16
17	8	19,643	23—16
18	9	19,609	23—15
19	10	19,565	23—13
20	11	19,510	23—11
21	12	19,456	23—08
22	13	19,399	23—06
23	14	19,394	23—06
24	15	19,365	23—04
25	16	19,280	23—00
26	17	19,182	22—20
27	18	19,063	22—15
28	19	18,956	22—09
29	20	18,829	22—04
30	21	18,739	22—00
31	22	18,641	21—15

NOVEMber	BABEH	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	23	18,548	21—07
2	24	18,440	20—22
3	25	18,331	20—12
4	26	18,224	20—02
5	27	18,113	19—17
6	28	18,003	19—07
7	29	17,916	18—23
8	30	17,805	18—14
9	1st HATOUR	17,704	18—05
10	2	17,631	17—22
11	3	17,510	17—22
12	4	17,427	17—04
13	5	17,347	16—21
14	6	17,287	16—15
15	7	17,218	16—09
16	8	17,218	16—09
17	9	17,106	16—00
18	10	17,049	15—21
19	11	16,992	15—19
20	12	16,939	15—16
21	13	16,874	15—14
22	14	16,817	15—11
23	15	16,754	15—08
24	16	16,704	15—06
25	17	16,640	15—03
26	18	16,600	15—01
27	19	16,543	14—23
28	20	16,493	14—20
29	21	16,444	14—18
30	22	16,395	14—16

DECEMBER	HATOUR	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	23	16,342	14—14
2	24	16,276	14—11
3	25	16,227	14—09
4	26	16,188	14—07
5	27	16,144	14—05
6	28	16,093	14—03
7	29	16,039	14—00
8	30	15,676	13—08
9	1st KEHIAK	15,961	13—20
10	2	15,921	13—19
11	3	15,864	13—16
12	4	15,836	13—15
13	5	15,805	13—14
14	6	15,757	13—12
15	7	15,718	13—10
16	8	15,686	13—09
17	9	15,659	13—07
18	10	15,622	13—06
19	11	15,595	13—05
20	12	15,568	13—03
21	13	15,540	13—02
22	64	15,506	13—01
23	15	15,484	13—00
24	16	15,459	12—22
25	11	15,430	12—21
26	18	15,408	12—20
24	19	15,380	12—19
28	20	15,342	12—18
29	21	15,310	12—16
30	22	15,281	12—15
31	23	15,262	12—14

JANUARY	KEHIAK	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	24	15,221	12—12
2	25	15,197	12—11
3	26	15,172	12—10
4	27	15,150	12—09
5	28	15,127	12—08
6	29	15,098	12—07
7	30	15,068	12—05
8	1st TOUBA	15,041	12—04
9	2	15,020	12—03
10	3	15,003	12—02
11	4	14,974	12—00
12	5	14.949	12—00
13	6	14,920	11—22
14	7	14,893	11—20
15	8	14,869	11—20
16	9	14,850	11—20
17	10	14,825	11—19
18	11	14,796	11—17
19	12	14,765	11—16
20	13	14,746	11—15
21	14	14,718	11—14
22	15	14,698	11—13
23	16	14,665	11—11
24	17	14,639	11—10
25	18	14,615	11—09
26	19	14,584	11—08
27	20	14,557	11—07
28	21	14,530	11—05
29	22	14,512	11—05
30	23	14,494	11—03
31	24	14,475	11—03

FEBRUARY	TOUBA	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	25	14,461	11—02
2	26	14,440	11—01
3	27	14,420	11—00
4	28	14,401	11—00
5	29	14,373	10—22
6	30	14,349	10—21
7	1st AMSHEER	14,324	10—20
8	2	14,304	10—19
9	3	14,275	10—18
10	4	14,251	10—17
11	5	14,231	10—16
12	6	14,189	10—14
13	7	14,188	10—14
14	8	14,172	10—14
15	9	14,147	10—12
16	10	14,114	10—11
17	11	14,097	10—10
18	12	14,074	10—09
19	13	14,048	10—08
20	14	14,024	10—07
21	15	14,009	10—06
22	16	13,981	10—05
23	17	13,956	10—04
24	18	13,929	10—03
25	19	13,910	10—02
26	20	13,892	10—01
27	21	13,911	10—02
28	22	13,890	10—01
29	23	13,889	10—01

MARCH	AMSHEER	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metres	Peeks Kirats
1	24	13,853	9—23
2	25	13,868	10—00
3	26	13,860	10—00
4	27	13,839	9—23
5	28	13,822	9—22
6	29	13,780	9—20
7	30	13,750	9—19
8	1st BARAMHAT	13,736	9—18
9	2	13,715	9—17
10	3	13,693	9—16
11	4	13,669	9—15
12	5	13,642	9—14
13	6	13,619	9—13
14	7	13,590	9—12
15	8	13,569	9—11
16	9	13,538	9—09
17	10	13,523	9—09
18	11	13,478	9—07
19	12	13,456	9—06
20	13	13,430	9—04
21	14	13,409	9—04
22	15	13,393	9—03
23	16	13,371	9—02
24	17	13,340	9—00
25	18	13,375	9—02
26	19	13,371	9—02
27	20	13,358	9—01
28	21	13,320	9—00
29	22	13,297	8—23
30	23	13,277	8—21
31	24	13,277	8—21

APRIL	BARTMHAT	Altitudes above the Mediterranean	Heights in Pecks and Kirats
		Metres	Pecks Kirats
1	25	13,248	8—20
2	26	13,218	8—19
3	27	13,179	8—18
4	28	13,164	8—17
5	29	13,138	8—15
6	30	13,123	8—15
7	1st BARMOUDA	13,096	8—14
8	2	13,081	8—13
9	3	13,062	8—12
10	4	13,073	8—12
11	5	13,057	8—12
12	6	13,037	8—11
13	7	13,018	8—10
14	8	13,000	8—09
15	9	12,982	8—09
16	10	12,966	8—08
17	11	12,937	8—07
18	12	12,913	8—05
19	13	12,895	8—05
20	14	12,904	8—05
21	15	12,901	8—05
22	16	12,886	8—04
23	17	12,871	8—04
24	18	12,844	8—03
25	19	12,829	8—02
26	20	12,816	8—01
27	21	12,796	8—00
28	22	12,776	7—23
29	23	12,759	7—23
30	24	12,760	7—23

MAY	BARMOUDA	Altitudes above the Mediterranean	Heights in Peeks and Kirats
		Metrrs	Peeks Kirats
1	25	12,744	7—21
2	26	12,742	7—21
3	27	12,731	7—21
4	28	12,715	7—21
5	29	12,698	7—20
6	30	12,690	7—20
7	1st BASHANS	12,700	7—20
8	2	12,704	7—20
9	3	12,690	7—20
10	4	12,674	7—19
11	5	12,663	7—18
12	6	12,637	7—18
13	7	12,650	7—18
14	8	12,646	7—17
15	9	12,637	7—17
16	10	12,628	7—17
17	11	12,625	7—17
18	12	12,622	7—17
19	13	12,595	7—15
20	14	12,578	7—14
21	15	12,567	7—14
22	16	12,561	7—14
23	17	12,548	7—14
24	18	12,533	7—13
25	19	12,518	7—12
26	20	12,504	7—11
27	21	12,493	7—11
28	22	12,469	7—10
29	23	12,461	7—10
30	24	12,456	7—09
31	25	12,441	7—09

In the preceding table the second column shows the Coptic months of the Julian Calendar.

As to the last column, its figures are the result of measurement at the Rodah Nilometer.

One Peek or "cubit" is divided into 24 kirats or "digits". The scale of the Nilometric column is not used; but the surveyor of the Nilometer adopts a scale of which there is no visible signs in the Nilometer chamber, and having its zero at the bottom of the well which is situated at an altitude of 8^m466 above the Mediterranean; the value of each Peek including the 16th is 0^m5404, but each of the six following, the 22nd included, has a lengh of 0^m2702.

Above the 22nd, each Peek resumes its normal length of 0^m5404.

At its lowest level the Nile reaches at the Rodah Nilometer 7 Peeks or 12^m249 above the Mediterranean; at 16 Peeks or 17^m112 of altitude, it is the custom to admit the new water into the Canals; and the average highest rise is 23 Peeks 20 Kirats or 19^m734 of altitude above the Mediterranean.

The average effective rise above the lowest water level is then 7^m485.

The table of average altitude of the Nile, which we have given is only for the Nilometer of Rodah opposite Old Cairo.—But it may also serve to give the fluctuations of the level of the Nile at other places; for this purpose, it will be sufficient to know the actual effective rise of the Nile at

each place, and to multiply each of the daily increase or decrease which is shown in the table, by the ratio of the total effective rise at each place to the total rise at the Rodah Nilometer.

Let us take for exemple Damietta, where high water level is at altitnde 1m08 and low water level at altitude 0m55.

The total effective rise of the Nile is then there 0m53; the ratio of this rise to the 7m485 at the Rodah Nilometer would be 0m07 by which all the figures of the table are to be multiplied in order to get figures representing the fluctuations at Damietta during the wholeyear.

We finally give the following tables which we trust may be found useful.

PLACES	Low water level	High water level	Ratio of total rise at each place to total rise at Rodah Nilometer
Damietta-Branch.			
	Metres	Metres	
Barrages.	10,93	18,82	1,054
Benha	8,548	14,04	0,734
Ziftè	6,971	12,08	0,683
Samanoud	5,359	9,32	0,529
Mansourah.	3,644	6,37	0,364
Damietta	0,558	1,08	0,070
Damietta mouth. . . .	0,000	0,000	0,000

PLACES	Low water level	High water level	Ratio of total rise at each place to total Rise at Nilometer
Rosetta branch.			
	Metres	Metres	
Manashy.	10,915	18,82	1,056
Wardan	9,207	15,98	0,905
Kafr Daoud	7,646	13,27	0,751
Terieh	6,438	10,90	0,596
Kafr Zayat.	5,268	8,87	0,481
Rahmanieh	3,557	5,42	0,249
Atfeh.	2,777	4.13	0,181
Rosetta	0,829	1,08	0,034
Rosetta mouth.	0,000	0,00	0,000

By multiplying the figures in the table of altitudes of the Nile by the figures in the column of ratios taken from the 2 above tables average altitudes of the Nile will be obtained for each place very approximately.

The following Table contain some informations about law water and high water level of 58 years.

Years	Lowest water level	Highest water level	Date of opening of the Canals	OBSERVATIONS	
	Metres	Metres			
1799	11,573	18,576	—	middling	French occupation
1800	12,181	19,499	—	abundant	
1825	12,039	17,968	—	sufficient	
1826	11,979	19,139	—	middling	
1827	12,012	18,914	—	do.	
1828	12,029	18,621	—	do.	
1829	12,031	19,859	—	very abund^{t}	
1830	12,013	18,554	—	middling	Typhus
1831	12,029	18,981	—	do.	1st cholera
1832	12,556	19,251	—	do.	
1833	12,019	17,941	—	insufficient	
1834	12,021	19,499	—	abundant	Plague & cholera
1835	11,994	18,092	—	insufficient	Famine
1836	11,999	18,385	—	do.	do.
1837	12,994	17,968	—	do.	do.
1838	12,006	18,598	—	middling	
1839	12,043	18,936	19 Augst	do.	Locusts
1840	11,990	19,859	1st »	very abund^{t}	Cholera & epizooty
1841	11,996	18,814	—	do.	
1842	12,990	19,859	20 »	do.	Plague & epizooty
1843	12,000	18,861	9 »	middling	
1844	12,003	18,801	17 »	do.	
1845	12,021	18,531	14 »	do.	
1846	12,015	19,792	—	abundant	Cholera
1847	12,006	19,319	—	middling	
1848	12,018	19,949	9 »	very abund^{t}	Cholera
1849	12,017	19,927	7 »	do.	

Years	Lowest water level	Highest water level	Date of opening of the Canals	OBSERVATIONS	
	Metres	Metres			
1850	12,033	18,689	10 Augst	middling	
1851	12,014	20,017	5 »	very abund^{t}	
1852	12,013	18,553	4 »	middling	
1853	12,014	20,017	31 July	very abund^{t}	Inundation
1854	12,195	19,792	12 Augst	abundant	
1855	12,010	18,396	12 »	weak	Cholera
1856	12,012	19,994	7 »	very abund^{t}	
1857	12,037	18,711	12 »	middling	
1858	12,029	18,621	14 »	do.	Comete
1859	12,034	18,542	8 »	weak	
1860	11,927	19,927	7 »	abundant	
1861	12,017	20,175	9 »	very abund^{t}	
1862	12,023	19,274	15 »	middling	
1863	12,002	20,355	1st »	very strong	
1864	12,031	18,159	1st »	insufficient	Epizooty
1865	12,021	19,251	17 »	middling	Cholera & locusts
1866	12,043	20,603	7 »	very strong	
1867	12,057	18,711	6 »	middling	
1868	12,023	18,069	15 »	insufficient	
1869	12,450	20,898	12 »	very strong	
1870	12,406	20,197	7 »	do.	
1871	12,564	19,634	7 »	abundant	
1872	12,000	19,904	6 »	do.	
1873	12,316	18,320	15 »	weak	
1874	12,271	21,145	2 »	very strong	Inundation
1875	12,406	19,769	9 »	abundant	
1876	12,470	20,152	6 »	very abund^{t}	do.
1877	12,496	17,360	24 »	insufficient	Famine
1878	11,663	21,030	10 »	very strong	Inundation
1879	13,902	20,062	3 »	very abund^{t}	
1880	13,059	18,655	2 »	middling	

one metre 39.37079 inches

3.280899 feet

1.093633 yard

Spot numbers
I have not got any
advantage in numbers
1760 - 3 ft
in kilometres yards etc.

To convert metres into feet
is a job. eg. Multiply any
figure.. 18.689 by
metres. 39.37079.
as that for 55 years.
a mere man I am inclined
to undertake for the sake
of science. The shortest plan
is take each sum, and
put it on section paper,
as a whole number.
18689. cutting off two
figures to give centimetres
only; thus 186 - on section
paper which is done.

The object is not to compare the actual rises of Nile Ganges Mississippi and Danube but to compare their yearly maxima upper & lower after Wolfs spot numbers plotted on section paper & that has been done. So as compare the curves roughly.

April 23. 1893. Cannes

[illegible]